

## On Assessing Pro-Poorness of Government Programmes: International Comparisons<sup>♥</sup>

Nanak Kakwani and Hyun H. Son<sup>\*</sup>

International Poverty Centre, UNDP

**Abstract:** This paper proposes a new index called “Pro-Poor Policy (PPP)” index. The PPP index measures pro-poorness of governments’ programmes, as well as basic service delivery in education, health, and infrastructure. The PPP index is derived as the ratio of actual proportional poverty reduction from a government programme, to the proportional poverty reduction that would have been achieved if every individual in society had received exactly the same benefits from the programme. The upper bound of the PPP index, derived in the paper in the realm of perfect targeting, provides a means to assess the targeting efficiency of government programmes. Furthermore, the paper develops two types of PPP indices by socioeconomic groups, which are within-group and total-group PPP indices. While the within-group PPP index measures the pro-poorness of a programme within the group, the total-group PPP index captures the impact of operating a programme in the group on its pro-poorness at national level. The paper argues that the targeting efficiency of particular group should be judged on the basis of total-group PPP index. Using micro unit-record data on household surveys, the proposed methodology is applied to Thailand, Russia, Vietnam, and 15 African countries.

---

<sup>♥</sup> We would like to acknowledge helpful comments received from Professors David Gordon and K. Sundaram.

<sup>\*</sup> Email address for correspondence: [hyun.son@undp-povertycentre.org](mailto:hyun.son@undp-povertycentre.org)

## 1. Introduction

Many governments in developing countries are increasingly considering introducing safety net programmes that provide income to the poor or those who face a probable risk, in the absence of the transfer, of falling into poverty. In designing such programmes, governments in developing countries are often faced with the choice between cash and in-kind transfers. Economic theory would lead us to believe that cash transfers are the preferred means of assistance. A range of economic as well as administrative considerations influence this choice (Grosh 1994, Jimenez 1993, Tabor 2002).

From an economic efficiency perspective, cash transfers are generally regarded as being superior to in-kind transfer as they do not directly distort market prices. When policymakers intervene to set prices that deviate from the marginal social benefit or marginal social cost, as occurs in the case of in-kind transfers schemes, resources will be used inefficiently (Blackorby and Donaldson 1998). To put it differently, transfer programmes that lower prices of targeted goods for the poor will cause individuals to produce more of these targeted goods than they would in the absence of the programme. Resources that could be used more efficiently in producing other goods and services are allocated to the production of these targeted goods for the poor. In the process, a certain amount of economic efficiency is lost.

Whether the transfer programmes are cash or in-kind, it is obvious that if our objective is to reduce poverty, the transfer programmes should be designed in a way that they lead to the maximum reduction in poverty under given resource constraints. To achieve this objective, perfect targeting will be an ideal solution when (i) only the poor get all the benefits, and (ii) benefits given to the poor are proportional to their income shortfall from the poverty line. To implement such a programme, however, we will need to have detailed information on people's income or consumption. "Such detailed information, and the administrative ability to use it is not present in most developing countries" (Haddad and Kanbur 1991). We generally resort to a proxy targeting, which makes the transfers based on easily observable socioeconomic characteristics of households. The proxy

targeting can never achieve 100 percent targeting efficiency. It is, therefore, important to know how good the proxy targeting is compared to the perfect targeting. In this paper, we provide a methodology to assess the targeting efficiency of government programmes.<sup>6</sup>

African countries. The final section summarizes the major findings emerging from the study.

## 2. Poverty Measures

We measure the pro-pooriness of a government policy by measuring its impact on poverty. If there are two policies  $A$  and  $B$ , then policy  $A$  is more (less) pro-poor than policy  $B$  if it achieves a greater (smaller) reduction in aggregate poverty with a given cost. Aggregate poverty can be measured in a variety of ways. In this paper, we will focus on a class of additively separable poverty measures that can be written as

$$\theta = \int_0^z P(z, x) f(x) dx \tag{1}$$

in (1), where  $\alpha$  is the parameter of inequality aversion. When  $\alpha = 0, 1$  and  $2$ , the poverty measure is a headcount ratio, poverty gap ratio and severity of poverty index, respectively.

To formulate a poverty reduction policy, we need to make a choice of poverty measure. For instance, the headcount ratio will require different policies than poverty gap and severity of poverty. The headcount ratio is a crude measure of poverty because it completely ignores the gap in incomes from the poverty line and the distribution of income among the poor. The severity of the poverty index has all the desirable properties.

### **3. Pro-Poor Policy Index**

Suppose there is a welfare transfer from the government, which leads to an increase in the recipients' income or consumption expenditure. Accordingly, there will be a reduction in poverty incurred from the increase in income. Suppose  $x$  is the income of a person before

t

$$\frac{d\theta}{\theta} = \frac{\bar{b}}{\theta} \int_0^z \frac{\partial P}{\partial x} f(x) dx \quad (4)$$

We define the pro-poor policy index as the ratio of actual proportional poverty reduction from the programme as given in (3), to the proportional poverty reduction that would have been achieved if every individual in society had received exactly the same benefits (equal to the average benefit from the programme) as given in (4). Thus, the pro-poor policy index is derived as

$$\lambda = \frac{1}{\bar{b} \eta \theta} \int_0^z \frac{\partial P}{\partial x} b(x) f(x) dx \quad (5)$$

where

$$\eta = \frac{1}{\theta} \int_0^z \frac{\partial P}{\partial x} f(x) dx \quad (6)$$

is the absolute elasticity of poverty: if everyone receives one unit of currency, then the poverty will change by  $100 \times \eta$  percent.

A programme will be called pro-poor (anti-poor) when  $\lambda > 1$  ( $< 1$ ). The larger the value of  $\lambda$ , the greater will be the degree of pro-poorness of the programme.

To calculate  $\lambda$ , programme does not have to be a programme of cash transfers. As a matter of fact, a large number of government programmes consist of providing various services in the areas of education, health and other social services. Although these services do not provide cash to individuals, they do contribute to their standard of living. Hence, it can be assumed that if a person utilizes a government service, then he/she receives some notional cash. If all individuals who utilize a government service are assumed to receive exactly the same benefits (in the form of notional cash), then we can

easily calculate the pro-poor policy index  $\lambda$ , by defining  $b(x) = 1$ , if a person is utilizing a service and 0 otherwise.

#### 4. Lower and Upper Bounds of PPP index

The PPP index has the lowest value of zero if the government programme does not reduce any poverty at all, which will happen when all benefits of the programme go to the non-poor. This situation can be described as:

$$b(x) = 0$$

$$\text{if } x < z$$

$$b(x) \geq 0$$

$$\text{if } x \geq z$$

where  $g$  is the poverty gap ratio.  $\lambda_m$  is the maximum value of PPP index, which is obtained under the situation of perfect targeting. Note that in the computation of  $\lambda_m$ , we do not need to assume one single poverty line for all households. Every household can have different poverty lines depending on the household composition and the regional prices faced by the households. In our empirical study of Thailand, the official poverty line varies with households. But in the case of Vietnam, the poverty line is fixed for all households. If we assume that all households have the same per capita poverty line, then by substitutions it is easy to demonstrate that the maximum value of  $\lambda_m$  for the poverty gap ratio is equal to the inverse ratio of the headcount index  $H$  (i.e.  $1/H$ ). Similarly, it can be easily proved that  $\lambda_m$  for the severity of poverty index is equal to  $\frac{1}{2}$



where  $\bar{b}_k$  is the mean benefit of the programme in the

Since the poverty measures given in (1) are additively decomposable, we can express the total poverty in country as the weighted average of poverty in individual groups with weights proportional to their population shares:

$$\theta = \sum_{k=1}^K a_k \theta_k \quad (14)$$

where  $a_k$  is the population share of the  $k$ th group such that  $\sum_{k=1}^K a_k = 1$  and  $\theta_k$  is the poverty measure in the  $k$ th group. Differentiating (14) in both sides gives

$$\frac{d\theta}{\theta} = \sum_{k=1}^K \left( \frac{a_k \theta_k}{\theta} \right) \left( \frac{d\theta_k}{\theta_k} \right) \quad (15)$$

Suppose a programme  $b(x)$  operates only in the  $k$ th group, then the proportional change in poverty in the  $k$ th group will be given by

$$\frac{d\theta_k}{\theta_k} = \frac{1}{\theta_k} \int_0^z \frac{\partial P}{\partial x} b(x) f_k(x) dx \quad (16)$$

where  $f_k(x)$  is the density function of the  $k$ th group. Utilizing (16) into (15), we obtain the proportional change in the national poverty, when the government programme operates only in the  $k$ th group, as:

$$\left( \frac{d\theta}{\theta} \right)_k = \frac{a_k}{\theta} \int_0^z \frac{\partial P}{\partial x} b(x) f_k(x) dx \quad (17)$$

Suppose  $\bar{b}_k$  is the mean benefit of the program in the  $k$ th group. So, the total cost per person (in the whole population) of operating the programme in the  $k$ th group is given by  $a_k \bar{b}_k$ . If we had considered a scenario of universal targeting of the whole population providing every individual the benefit equal to  $a_k \bar{b}_k$ , then the proportional reduction in national poverty would have been  $a_k \bar{b}_k \eta$ . Obviously then, operating programme in the

$k$ th group will be pro-poor if the magnitude of poverty reduction in (17) is greater than the poverty reduction obtained with the universal targeting, while incurring the same cost. Thus, we define PPP index for the  $k$ th group as:

$$\lambda_k^* = \frac{1}{b_k \eta \theta} \int_0^z \frac{\partial P}{\partial x} b(x) f_k(x) dx \quad (18)$$

Using (18), operating the government programme  $b(x)$  in the  $k$ th group is pro-poor (anti-poor) if  $\lambda_k^*$  is greater (less) than 1. Note that  $\lambda_k^*$  measures the pro-poorness of the programme with respect to the whole population and not with respect to the population within the  $k$ th group.

Utilizing (5), (12) and (18) easily gives the following:

$$\lambda = \frac{1}{b} \sum_{k=1}^K \bar{b}_k a_k \lambda_k^* \quad (19)$$

which shows that the pro-poor policy index for the whole country is the weighted average of the pro-poor policy indices for the individual groups, with weight proportional to shares of benefits received by each group.

Equation (19) demonstrates that to reduce poverty at na

Thailand and Russia to capture the extent to which the governments' welfare schemes benefit the poor, the PPP index is applied to Vietnam to estimat

Table 1: Pro-Poor Policy Index for welfare programs in Thailand: 2000

Welfare Schemes		
Social pension for the elderly	1.68	1.54
Low-income medical cards	2.02	2.12
Health insurance cards	1.29	1.25
Free school lunches	2.02	2.06
<i>Perfect targeting</i>	<i>6.77</i>	<i>10.31</i>
<i>Universal social pensions (for elderly over 65 years)</i>		

succeeded in im

for this is that welfare programmes in Thailand are better targeted in the urban areas than in the rural areas. Since the concentration of poor is higher in the rural areas, the impact of targeting the rural areas turns out to be more pro-poor at the national level. It is worth stressing that the targeting efficiency of particular group should be judged on the basis of total-group PPP index.

The old-age pension is the largest welfare program benefiting about 26.32 million people.

The second larges



As can be seen from the table, the benefits as a whole have the value of the PPP index far greater than 1. From this, we may conclude that the welfare system in Russia tends to benefit the poor more than the non-poor. More importantly, the absolute benefits of the welfare system do indeed flow more to the ultra-poor than to the poor as suggested by the value of PPP index for the severity of poverty measure, equal to 3.90. Note that the PPP index of all benefits is the weighted average of the PPP indices of all 9 welfare programmes, with the weight proportional to the share of each programme presented in the third column of Table 3.

Table 4 also reveals that if the government of the Russian Federation had implemented perfect targeting, the PPP index would have been 3.02 and 5.71 for the poverty gap and the severity of poverty, respectively. This suggests that although Russian welfare programmes are not perfectly targeted at the poor, their deviation from perfect targeting is not large.

It is important to note that welfare programmes such as children-allowance given to those aged below 16 years old and scholarships are not pro-poor particularly for the severity of poverty index. This is evident from the result that the PPP indices of these two programmes for the severity of poverty measure fall far below unity. This suggests that the absolute benefits of these programmes do not flow to the ultra-poor. This further suggests that these programmes may require a better targeting than the current system in a way that favors the ultra-poor living far below the poverty threshold.

Over the past decade or so, Vietnam has enjoyed a significant improvement in standard of living with its impressive performance in growth and poverty reduction. More importantly, its growth process has been pro-poor in a way that the growth benefits the poor proportionally more than the non-poor (Kakwani and Son 2004). In this context, it will be interesting to see whether, along with a rising standard of living and its pro-poor

growth, poor people benefit from the utilization of current health services in Vietnam. Table 5 presents the PPP index for the utilization of various health facilities in Vietnam.

As the results in Table 5 reveal that, only commune health centres show the index value greater than 1. This suggests that the poor overall have greater access to commune health centres than the non-poor. It seems that commune health centres play an important role in providing basic health services to the poor in Vietnam. Unfortunately, commune health centres do not provide quality health services because they are generally poorly staffed and equipped. Thus, the poor in Vietnam are not receiving the quality of health services provided by commune health centres.

Public hospitals in Vietnam provide higher quality care and are mainly utilized by individuals with health insurance. It can be noted that the utilization of government hospitals is shown to have the value of PPP index far less than 1, implying that public hospitals in Vietnam provide greater benefits to the non-poor than the poor. vtprovi0029 Tw 12.0504 0 0 12.

government hospitals. Moreover, insurance coverage under the health insurance programme is more extensive for the relatively better-off individuals. As such, having health insurance is positively correlated with the individuals' income: while the insurance 9m(a)Tj12.0504 0



As shown in Table 6, lower secondary education in Vietnam is not pro-poor as indicated by the PPP index. This finding emerges consistently irrespective of school types. At the lower secondary level, net enrollment rates more than doubled in Vietnam between 1993 and 1998, 30 percent and 62 percent, respectively. However, for the population as a whole, 38 percent of children aged 11-14 years old were not enrolled in lower secondary school, and 66 percent of the poorest children in this age range were not enrolled in primary school. The disparity in the enrollment rates between the richest and poorest quintiles is highly distinctive over the years.

As would be expected, the PPP index signals that upper secondary schools highly favour children from the better-off households compared to those from poor households. This is consistent with all types of schools at this level. Note that there are no children from poor households who were enrolled in the upper secondary level schools sponsored by the private sector. Over the period 1993-98, children from the poorest quintile experienced an increase in enrollment in upper secondary schools from 1 to 5 percent as compared to an increase from 21 to 64 percent for the richest quintile (Nguyen 2002). On the whole, much still needs to be done to achieve universal primary and secondary education in Vietnam. Having said that, we follow up with whether universal education can really deliver educational outcomes that are pro-poor. The PPP index under universal education is compared to that under the current education system.

Table 7 manifests that universal education at primary and lower secondary levels will provide more benefits to the poor children than to non-poor ones. The degree of pro-poorness of universal access to primary education among 6 to 10-year-old children is almost as high as that actually obtained from the current education system in Vietnam. Similarly, if lower secondary education is made universal for children aged between 11 and 14 years, it will provide pro-poor outcomes.

universal education at higher levels will not be pro-poor, but will provide greater opportunities to poor individuals aged between 15 and 17 for upper secondary to have greater access to higher edu

## **7. Case Studies II: Targeting Children in Africa**

The study utilizes the unit-record household data sets from 15 African countries. These data sets were obtained from the African Household Survey Data Bank of the World Bank. The countries and year of the survey include: Burundi in 1998, Burkina Faso in 1998, Ivory Coast in 1998, Cameroon in 1996, Ethiopia in 2000, Ghana in 1998, Guinea in 1994, Gambia in 1998, Kenya in 1997, Madagascar in 2001, Mozambique in 1996, Malawi in 1997, Nigeria in 1996, Uganda in 1999, and Zambia in 1998.

The study uses the national poverty lines for the 15 countries, which have been obtained from various poverty assessment reports. These poverty lines were originally very crude, and did not take into account different needs of household members by age and gender. What is more, these poverty lines were not adjusted for the economies of scale which exist in large households. To overcome these shortcomings stemming from the official poverty lines, Kakwani and Subbarao (2005) made some modifications to the national poverty lines taking into account different needs of household members and economies of scale.

According to Coady, Grosh, and Hoddinott (2002), more than a quarter of targeted programmes in developing countries overall had regressive benefit incidence. For instance, they found that the poorest 40 percent of the income distribution was receiving less than 40 percent of poverty alleviation budgets. Such ineffective targeting of poor households suggests that the overall impact on poverty is much smaller than that it would have been if

In this section, we estimate the PPP indices under a universal transfer programme for the children aged between 5 and 16 years old. Under this programme, every child that belongs to this age group is assumed to receive a certain amount of transfer, irrespective of their poverty status. The results are presented in both Figure 1 and Table 9.

From Figures 1 and 2, it is important to note that the value of PPP index with perfect targeting is quite small compared to the index values that were shown for Thailand, Russia, and Vietnam. In fact, the PPP indices under perfect targeting show a small difference from the indices resulted from universal transfers. This suggests that perfect targeting may not be necessary in cases like these 15 Afre these 15 Afre these 1targeting thotingdes,05040 C



Figure 2: PPP indices under perfect targeting for 18 countries  
(poverty gap ratio)

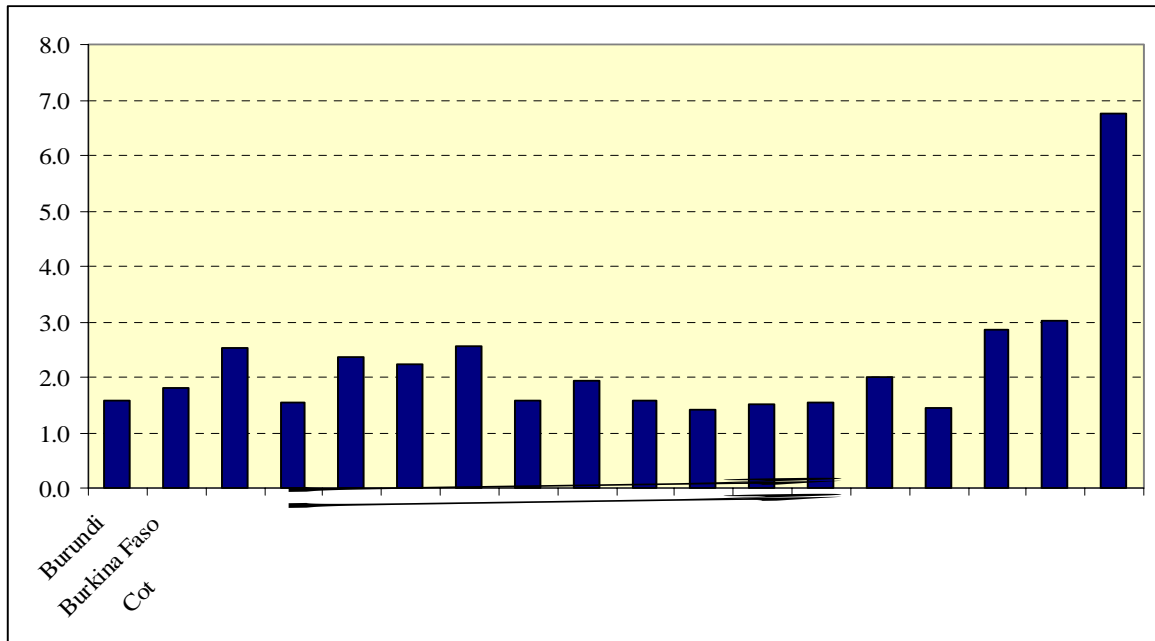


Table 9 carries two important messages. Firstly, the results indicate that universal transfers will provide more absolute benefits to children from poor families than those from non-poor families. Secondly, universal-transfer scheme is likely to bring even more pro-poor outcome if it is implemented in the rural areas where most of poor children are. One exception is in the case of Nigeria. This occurs because poverty in Nigeria is widespread over both the urban and rural areas, whereas in the other countries poverty is predominant in rural areas.

One criticism of this methodology is that we do not have actual scenario that can compare targeted transfers with universal transfers. Nevertheless, the main implication emerging from the PPP index is that if a transfer is given to every child aged between 5-16 years old, it is likely to provide more absolute benefits to poor children, particularly in rural areas. What is more, this analysis suggests that universal targeting of children may not be a bad policy option in rural areas in particular. This may be more cost effective as targeting only a small subgroup of children may involve large administrative costs in identifying the poor ones.

## **8. Conclusions**

This paper has proposed a new index called Pro-Poor Policy (PPP) index. The PPP index was derived to capture the degree of pro-poorness of government welfare programmes as well as public basic services in education and health. The index was estimated for two poverty measures – poverty gap ratio and severity of poverty – determined by the value of the inequality aversion parameter. Moreover, the paper derived lower and upper bounds of the PPP index. While the lower bound of the index is zero (when all the benefits go to the non-poor), the upper bound of the index is the maximum attainable value that would be expected under perfect targeting. The upper bound of the PPP index provides a means to assess the targeting efficiency of government programmes. Furthermore, the study developed two types of PPP indices that differ by socioeconomic groups. One was referred to as the within-group PPP index and the other was named as the total-group PPP index. While the within-group PPP index measures the pro-poorness



Thirdly, basic services – health and education – in Vietnam were found to be mostly not pro-poor. From health perspective, although government hospitals provide the highest quality of health care, the poor are unlikely to utilize them. This is, however, not true for commune health centres which appear to provide more services to individuals from poor households. Unfortunately, commune health centres do not provide quality health services because they are in general poorly staffed and equipped. On the whole, the poor in Vietnam have less access to quality health care. In view of the educational services, public primary schools were found to be pro-poor in Vietnam. This was due partly to the increase in public spending on education for the poor in the 1990s. Hhtrue for p

## References

Blackorby, C., and Donaldson, D (1998) "Cash versus In-kind, Self-selection, and Efficient Transfers." *American Economic Review* 78(4): 691-700

Foster, J., Gr

Tabor, S. R. (2002) “Assisting the Poor with Cash: Design and Implementation of Social Transfer Programmes” Social Protection Discussion Paper, World Bank: Washington D.C.

Trivedi, P. (2002) “Patterns of Health Care Utilization in Vietnam”, World Bank Policy Research Working Paper, World Bank: Washington D.C.